

DISCIPLINA MEDICINA DE URGENTA

RESUSCITAREA CARDIOPULMONARĂ ȘI CEREBRALĂ LA ADULT

PROGRAM

- ***ZIUA I: Introducere în resuscitare
Suportul vital de bază (Basic Life Support)***
- ***ZIUA II - III: Suportul vital avansat (Advanced
Life Support)***
- ***ZIUA IV: Suportul vital avansat - situații
speciale de resuscitare***
- ***ZIUA V: Evaluare teoretică și practică***

ILCOR

International Liaison Committee On Resuscitation

- **1992 - Constituire**
- **1996 - Ghiduri Internaționale Algoritm Universal**
- **2006 – EuReCa – registrul european SCR**
- **2015 – ERC ultima revizuire ghiduri**

Adult basic life support and automated external defibrillation

- The ERC Guidelines 2015 highlight the critical importance of the interactions between the emergency medical dispatcher, the bystander who provides CPR and the timely deployment of an AED. An effective, co-ordinated community response that draws these elements together is key to improving survival from out-of-hospital cardiac arrest.
- The emergency medical dispatcher plays an important role in the early diagnosis of cardiac arrest, the provision of dispatcher-assisted CPR (also known as telephone CPR), and the location and dispatch of an AED.
- The bystander who is trained and able should assess the collapsed victim rapidly to determine if the victim is unresponsive and not breathing normally and then immediately alert the emergency services.
- The victim who is unresponsive and not breathing normally is in cardiac arrest and requires CPR. Bystanders and emergency medical dispatchers should be suspicious of cardiac arrest in any patient presenting with seizures and should carefully assess whether the victim is breathing normally.
- CPR providers should perform chest compressions for all victims in cardiac arrest. CPR providers trained and able to perform rescue breaths should combine chest compressions and rescue breaths. Our confidence in the equivalence between chest compression-only and standard CPR is not sufficient to change current practice.
- High-quality CPR remains essential to improving outcomes. The guidelines on compression depth and rate have not changed. CPR providers should ensure chest compressions of adequate depth (at least 5 cm but no more than 6 cm) with a rate of 100–120 compressions min⁻¹. After each compression allow the chest to recoil completely and minimise interruptions in compressions. When providing rescue breaths/ventilations spend approximately 1 s inflating the chest with sufficient volume to ensure the chest rises visibly. The ratio of chest compressions to ventilations remains 30:2. Do not interrupt chest compressions for more than 10 s to provide ventilations.
- Defibrillation within 3-5 min of collapse can produce survival rates as high as 50-70 %. Early defibrillation can be achieved through CPR providers using public access and on-site AEDs. Public access AED programmes should be actively implemented in public places that have a high density of citizens.
- The adult CPR sequence can be used safely in children who are unresponsive and not breathing normally. Chest compression depths in children should be at least one third of the depth of the chest (for infants that is 4 cm, for children 5 cm).

Adult advanced life support

The ERC 2015 ALS Guidelines emphasise improved care and implementation of the guidelines in order to improve patient focused outcomes. The key changes since 2010 are:

- Continued emphasis on the use of rapid response systems for care of the deteriorating patient and prevention of in-hospital cardiac arrest.
- Continued emphasis on minimally interrupted high-quality chest compressions throughout any ALS intervention: chest compressions are paused briefly only to enable specific interventions. This includes minimising interruptions in chest compressions for less than 5 s to attempt defibrillation.
- Keeping the focus on the use of self-adhesive pads for defibrillation and a defibrillation strategy to minimise the preshock pause, although we recognise that defibrillator paddles are used in some settings.
- There is a new section on monitoring during ALS with an increased emphasis on the use of waveform capnography to confirm and continually monitor tracheal tube placement, quality of CPR and to provide an early indication of return of spontaneous circulation (ROSC).
- There are a variety of approaches to airway management during CPR and a stepwise approach based on patient factors and the skills of the rescuer is recommended.
- The recommendations for drug therapy during CPR have not changed, but there is greater equipoise concerning the role of drugs in improving outcomes from cardiac arrest.
- The routine use of mechanical chest compression devices is not recommended, but they are a reasonable alternative in situations where sustained high-quality manual chest compressions are impractical or compromise provider safety.
- Peri-arrest ultrasound may have a role in identifying reversible causes of cardiac arrest.
- Extracorporeal life support techniques may have a role as a rescue therapy in selected patients where standard ALS measures are not successful.

Cardiac arrest in special circumstances

Special causes

This section has been structured to cover the potentially reversible causes of cardiac arrest that must be identified or excluded during any resuscitation. They are divided into two groups of four - 4Hs and 4Ts: hypoxia; hypo-/hyperkalaemia, and other electrolyte disorders; hypo-/hyperthermia; hypovolaemia; tension pneumothorax; tamponade (cardiac); thrombosis (coronary and pulmonary); toxins (poisoning).

- Survival after an asphyxia-induced cardiac arrest is rare and survivors usually have severe neurological impairment. During CPR, early effective ventilation of the lungs with supplementary oxygen is essential.
- A high degree of clinical suspicion and aggressive treatment can prevent cardiac arrest from electrolyte abnormalities. The new algorithm provides clinical guidance to emergency treatment of life-threatening hyperkalaemia.
- Hypothermic patients without signs of cardiac instability can be rewarmed externally using minimally invasive techniques. Patients with signs of cardiac instability should be transferred directly to a centre capable of extracorporeal life support (ECLS).
- Early recognition and immediate treatment with intramuscular adrenaline remains the mainstay of emergency treatment for anaphylaxis.
- A new treatment algorithm for traumatic cardiac arrest was developed to prioritise the sequence of life-saving measures.
- Transport with continuing CPR may be beneficial in selected patients where there is immediate hospital access to the catheterisation laboratory and experience in percutaneous coronary intervention (PCI) with ongoing CPR.
- Recommendations for administration of fibrinolytics when pulmonary embolism is the suspected cause of cardiac arrest remain unchanged.

Special environments

The special environments section includes recommendations for the treatment of cardiac arrest occurring in specific locations. These locations are specialised healthcare facilities (e.g. operating theatre, cardiac surgery, catheterisation laboratory, dialysis unit, dental surgery), commercial airplanes or air ambulances, field of play, outside environment (e.g. drowning, difficult terrain, high altitude, avalanche burial, lightning strike and electrical injuries) or the scene of a mass casualty incident.

- A new section covers the common causes and relevant modification to resuscitative procedures in patients undergoing surgery.
- In patients following major cardiac surgery, key to successful resuscitation is recognising the need to perform immediate emergency resternotomy, especially in the context of tamponade or haemorrhage, where external chest compressions may be ineffective.
- Cardiac arrest from shockable rhythms (ventricular fibrillation (VF) or pulseless ventricular tachycardia (pVT) during cardiac catheterisation should immediately be treated with up to three stacked shocks before starting chest compressions. Use of mechanical chest compression devices during angiography is recommended to ensure high-quality chest compressions and to reduce the radiation burden to personnel during angiography with ongoing CPR.
- AEDs and appropriate CPR equipment should be mandatory on board of all commercial aircraft in Europe, including regional and low-cost carriers. Consider an over-the-head technique of CPR if restricted access precludes a conventional method.
- Sudden and unexpected collapse of an athlete on the field of play is likely to be cardiac in origin and requires rapid recognition and early defibrillation.

Submersion exceeding 10 min is associated with poor outcome. Bystanders play a critical role in early rescue and resuscitation. Resuscitation strategies for those in respiratory or cardiac arrest continue to prioritise oxygenation and ventilation.

The chances of good outcome from cardiac arrest in difficult terrain or mountains may be reduced because of delayed access and prolonged transport. There is a recognised role of air rescue and availability of AEDs in remote but often-visited locations.

The cut-off criteria for prolonged CPR and extracorporeal rewarming of avalanche victims in cardiac arrest have become more stringent to reduce the number of futile cases treated with extracorporeal life support (ECLS).

Safety measures are emphasised when providing CPR to the victim of an electrical injury.

During mass casualty incidents (MCIs), if the number of casualties overwhelms healthcare resources, withhold CPR for those without signs of life.

A foreign body causing severe airway obstruction is a medical emergency and requires prompt treatment with back blows and, if that fails to relieve the obstruction, abdominal thrusts. If the victim becomes unresponsive CPR should be started immediately whilst help is summoned.

Special patients

The section on special patients gives guidance for CPR in patients with severe comorbidities (asthma, heart failure with ventricular assist devices, neurological disease, obesity) and those with specific physiological conditions (pregnancy, elderly people).

- In patients with ventricular assist devices (VADs), confirmation of cardiac arrest may be difficult. If during the first 10 days after surgery, cardiac arrest does not respond to defibrillation, perform resternotomy immediately.
- Patients with subarachnoid haemorrhage may have ECG changes that suggest an acute coronary syndrome (ACS). Whether a computed tomography (CT) brain scan is done before or after coronary angiography will depend on clinical judgement.
- No changes to the sequence of actions are recommended in resuscitation of obese patients, but delivery of effective CPR may be challenging. Consider changing rescuers more frequently than the standard 2-min interval. Early tracheal intubation is recommended.
- For the pregnant woman in cardiac arrest, high-quality CPR with manual uterine displacement, early ALS and delivery of the foetus if early return of spontaneous circulation (ROSC) is not achieved remain key interventions.

Post-resuscitation care

This section is new to the European Resuscitation Council Guidelines; in 2010 the topic was incorporated into the section on ALS. The ERC has collaborated with the European Society of Intensive Care Medicine to produce these post-resuscitation care guidelines, which recognise the importance of high-quality post-resuscitation care as a vital link in the Chain of Survival.

The most important changes in post-resuscitation care since 2010 include:

- There is a greater emphasis on the need for urgent coronary catheterisation and percutaneous coronary intervention (PCI) following out-of-hospital cardiac arrest of likely cardiac cause.

Targeted temperature management remains important but there is now an option to target a temperature of 36°

C instead of the previously recommended 32–34°C. The prevention of fever remains very important.

Prognostication is now undertaken using a multimodal strategy and there is emphasis on allowing sufficient time for neurological recovery and to enable sedatives to be cleared.

A novel section has been added which addresses rehabilitation after survival from a cardiac arrest. Recommendations include the systematic organisation of follow-up care, which should include screening for potential cognitive and emotional impairments and provision of information.

CAUZE DE STOP CARDIORESPIRATOR

- *Insuficiența respiratorie :*
 - afectarea centrului respirator
 - oboseala musculară
 - leziuni ale cutiei toracice
 - afecțiuni pulmonare

CAUZE DE STOP CARDIORESPIRATOR

OBSTRUCȚIA DE CĂI AERIENE (1)

- Sânge
- Vărsătură
- Corpi străini
- Traumatism direct al feței și gâtului
- Depresia sistemului nervos central
- Epiglotite
- Faringite obstructive

CAUZE DE STOP CARDIORESPIRATOR

OBSTRUCȚIA DE CĂI AERIENE (2)

- Criza de “grand mal”
- Laringospasm
- Bronhospasm
- Secreții bronsice
- Edem al mucoasei
- Aspirația de conținut gastric

CAUZE DE STOP CARDIORESPIRATOR

CAUZE CARDIACE PRIMARE

- - Boala cardiacă ischemică
- - Cardiomiopatii
- - Valvulopatii
- - Sindrom QT prelungit
- - Cardiopatii congenitale

CAUZE DE STOP CARDIORESPIRATOR

CAUZE CARDIACE SECUNDARE

- Hipoxia
- Hipovolemia severă
- Hipotermia severă
- Sepsis
- Pneumotoraxul compresiv
- Intoxicații
- Electrocuția
- Dezechilibre hidroelectrolitice

MECANISME DE OPRIRE A CORDULUI

- Fibrilația ventriculară/ tahicardia ventriculară fără puls
- Asistola
- Activitatea electrică fără puls

ELEMENTE DECISIVE IN RATA SUPRAVIEȚUIRII ÎN STOPUL CARDIORESPIRATOR

- Recunoașterea semnelor de alarmă
- Activarea sistemului medical de urgență
- Suportul vital de bază
- Defibrilarea
- Căi aeriene libere, ventilație
- Stabilirea unei linii venoase

RATA SUPRAVIEȚUIRII ÎN STOPUL CARDIORESPIRATOR

0 – 50%

(64%, 80%?)

RATA SUPRAVIEȚUIRII ÎN STOPUL CARDIORESPIRATOR

- Mod de raportare diferit (*stilul Utstein*)
- Reușita RCP e influențată de foarte mulți factori

CE INFLUENȚEAZĂ RATA SUPRAVIEȚUIRII?

- Vârsta
- Condițiile comorbide
- SCR în antecedente
- Rasa
- Statusul socioeconomic
- Asistarea SCR
- Prespital - Spital
- Urban - Rural
- Echipa de resuscitare (experiență, componență, competență)
- Monitorizarea SCR
- Ritmul SCR
- Durata resuscitării
- Tehnica protezării căilor aeriene
- Numărul de defibrilări

CE INFLUENȚEAZĂ RATA SUPRAVIEȚUIRII?

- Monofazic - Bifazic?
- Adrenalină - Vasopresină?
- Amiodaronă - Xilină?
- Atropină?
- Intervalul de timp până la activarea SMU
- Intervalul de timp până la SVB
- Intervalul de timp până la defibrilare
- Intervalul de timp până la IOT
- Dispozitive mecanice de suport circulator
- Pacing
- *ș.a.m.d*

CE INFLUENȚEAZĂ RATA SUPRAVIEȚUIRII?

INTERVALUL DE TIMP SCR – SVB

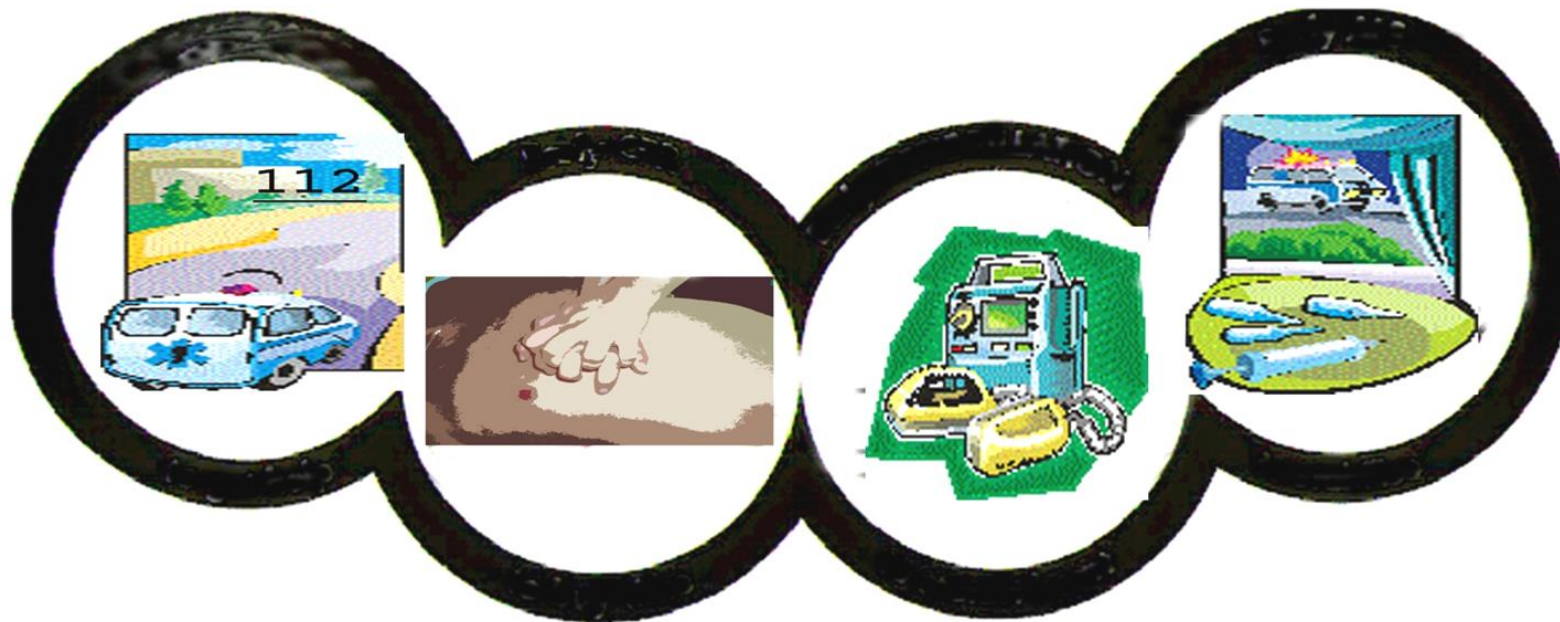
INTERVALUL DE TIMP SCR - DEFIBRILARE

SCR-SVB SCR-Defibrilare

<10min >10min

<5min 37%

>5min 0%



Recunoaștere rapidă
și alarmare precoce

SVB
precoce

Defibrilare
precoce

SVA
precoce

Care este cea mai importantă
“verigă” din “lanțul
supraviețuirii”?

RECUNOAȘTERE RAPIDĂ ȘI ALARMARE PRECOCE

- Recunoașterea unui pacient în SCR
- Anunțarea (telefonică)
- Dispecerat
- Echipaj de urgență
- Echipament

112

SVB PRECOCE

- Efectuată de persoane laice
- Până la sosirea echipajului de urgență
- **Dublează supraviețuirea**

SVB PRECOCE

SCR - SVB

SCR - Defibrilare

<10min

>10min

<5min

37%

>5min

20%

0%

DEFIBRILARE PRECOCE

- Fiecare 1 minut scade șansa de supraviețuire cu 7 - 10 %
- După 4 - 6 minute - leziuni neurologice
- După 10 minute - tentative de resuscitare nereușite

DEA ÎN 8-10 MINUTE!

DEFIBRILARE PRECOCE

- Defibrilatoare externe automate
- Utilizare sigură
- Legislație permissivă în utilizarea DEA (*“Good Samaritan Law”*)
- 1 DEA – 10.000 locuitori
(*aglomerări populaționale, aeroporturi, locuri de muncă, mașini de poliție, pompieri, cazinouri, etc.*)

DEFIBRILARE PRECOCE

SCR - SVB SCR - Defibrilare

<10min

>10min

<5min

37%

7%

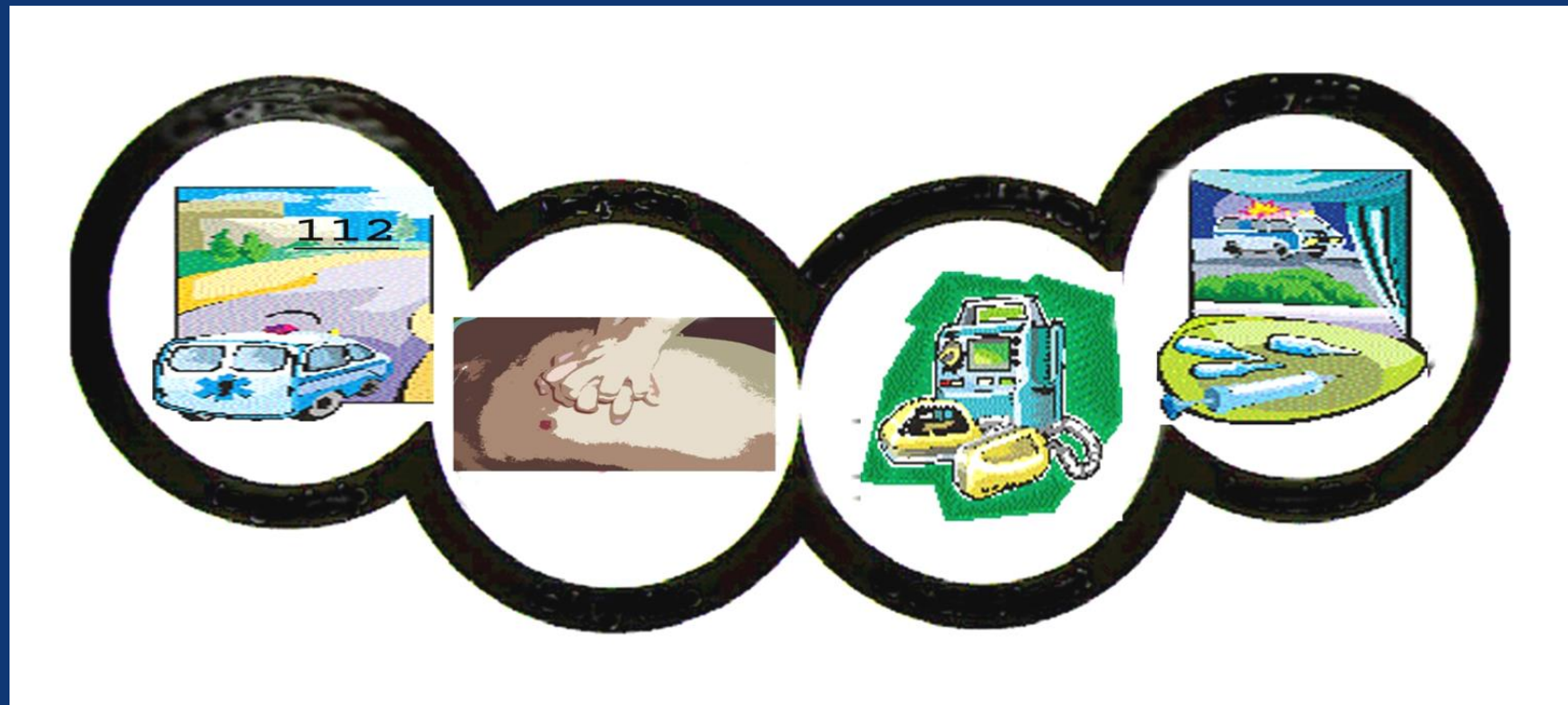
>5min

20%

0%

LANȚUL SUPRAVIEȚUIRII

DEFINIȚIE?



RISCURILE SALVATORULUI

RISCURI LEGATE DE MEDIU

„Salvatorul nu se va expune niciodata la un risc mai mare decît victima“

- trafic
- automobilul
- construcții instabile
- gaze și substanțe toxice
- cabluri electrice

Colaborarea cu servicii speciale
(descarcerare, poliție pompieri)

Apropierea cu grija de victima

RISCURILE SALVATORULUI

RISCURI LEGATE DE VICTIMĂ

„Salvatorul nu se va expune niciodată la un risc mai mare decât victima“

- infecții: hepatita B, HIV
- otrăviri: cianuri, hidrogen sulfurat, substanțe corozive, compuși organofosforici

Evitarea contactului cu produse biologice ale pacientului.

Folosirea materialelor de protecție: mască facială, mănuși, ochelari, etc.

SUPORTUL VITAL DE BAZĂ SVB

- Recunoașterea stopului cardiorespirator
- Manevre de bază de susținere a vieții
- Ventilații și compresii toracice
- Scop: oxigenarea cerebrală și cardiacă

SUPORTUL VITAL DE BAZA SVB

- **Definiție:** menținerea libertății căilor aeriene, suportul ventilației și circulației fără ajutorul vreunui echipament, cu excepția dispozitivelor de protecție.
- **Scopul SVB:** oxigenarea cerebrală și cardiacă
- Crește eficiența defibrilării

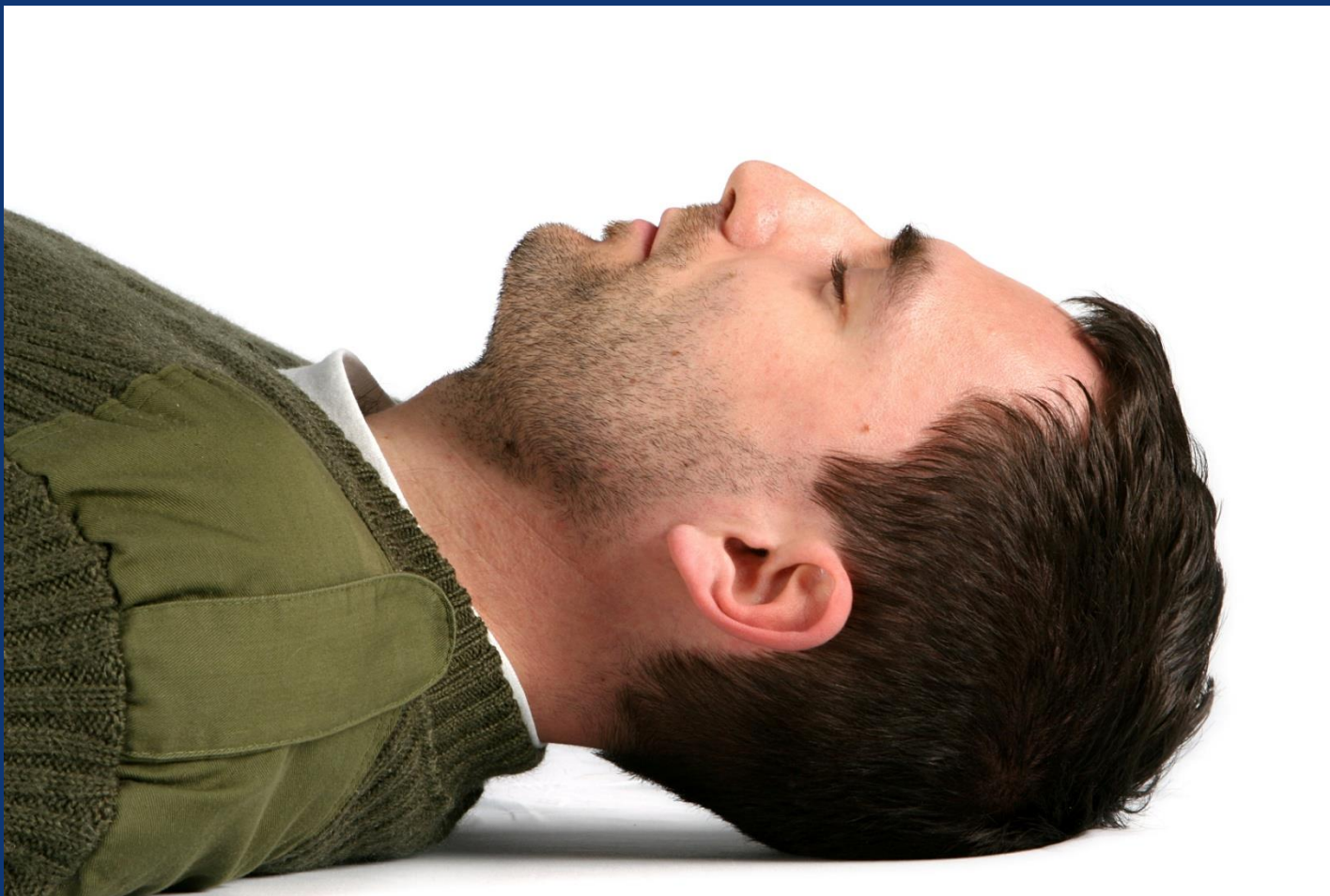
EVALUAREA CONȘTIENȚEI



ALERTAREA



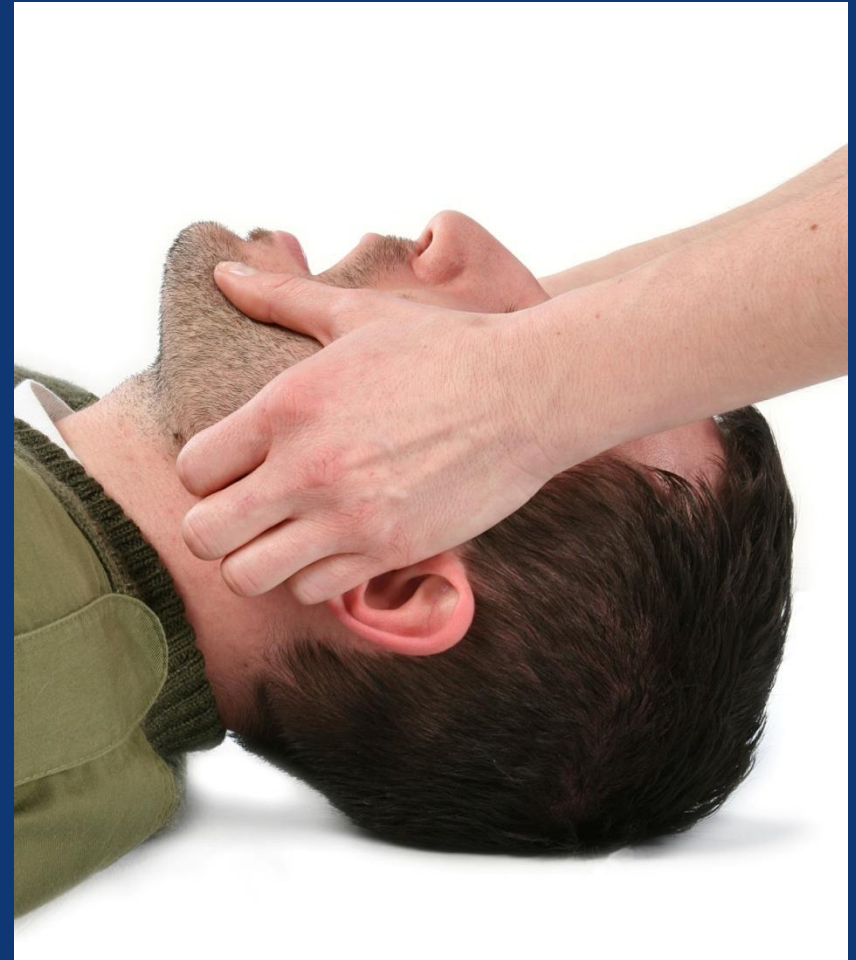
DESCHIDEREA CĂILOR AERIENE



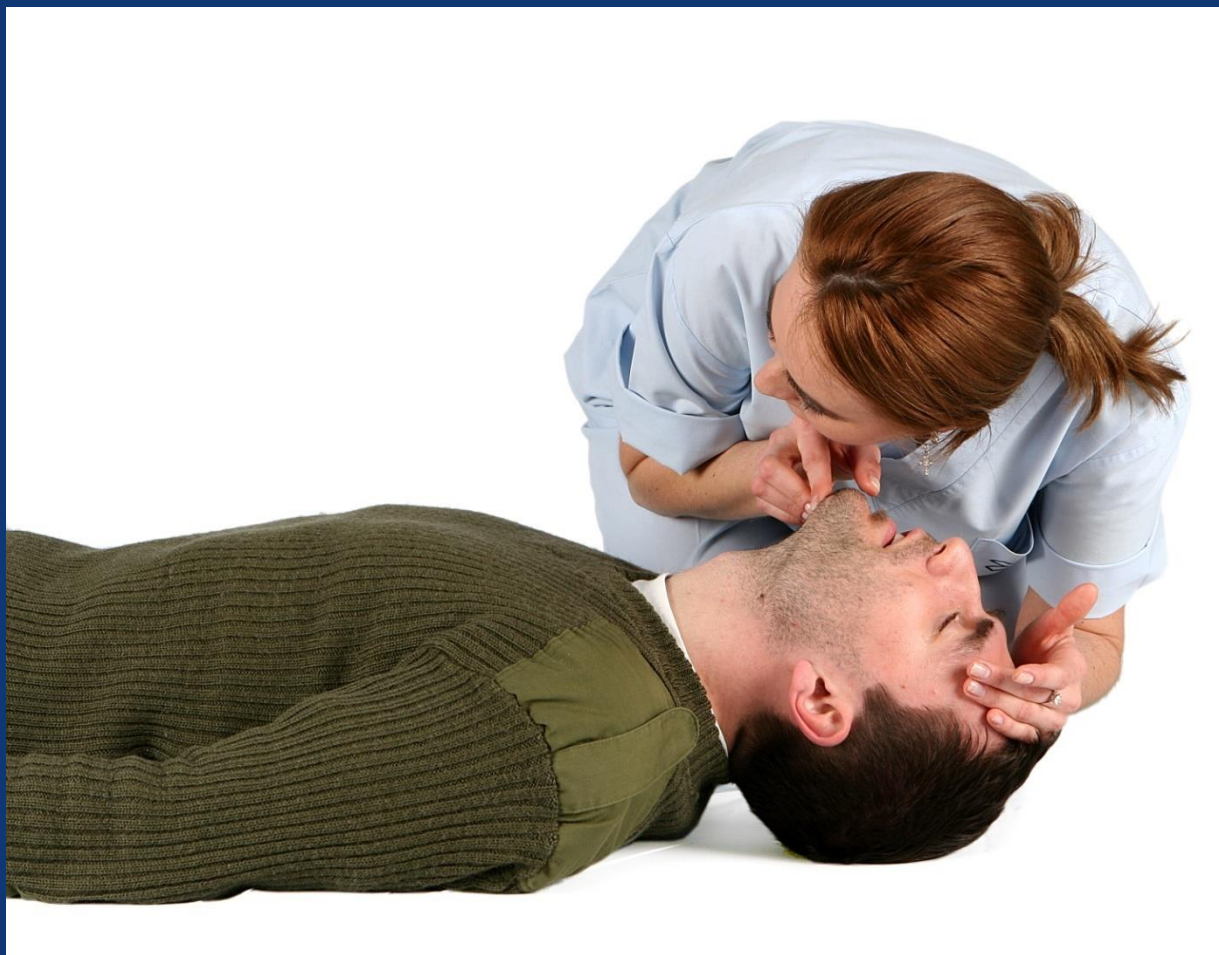
DESCHIDEREA CĂILOR AERIENE



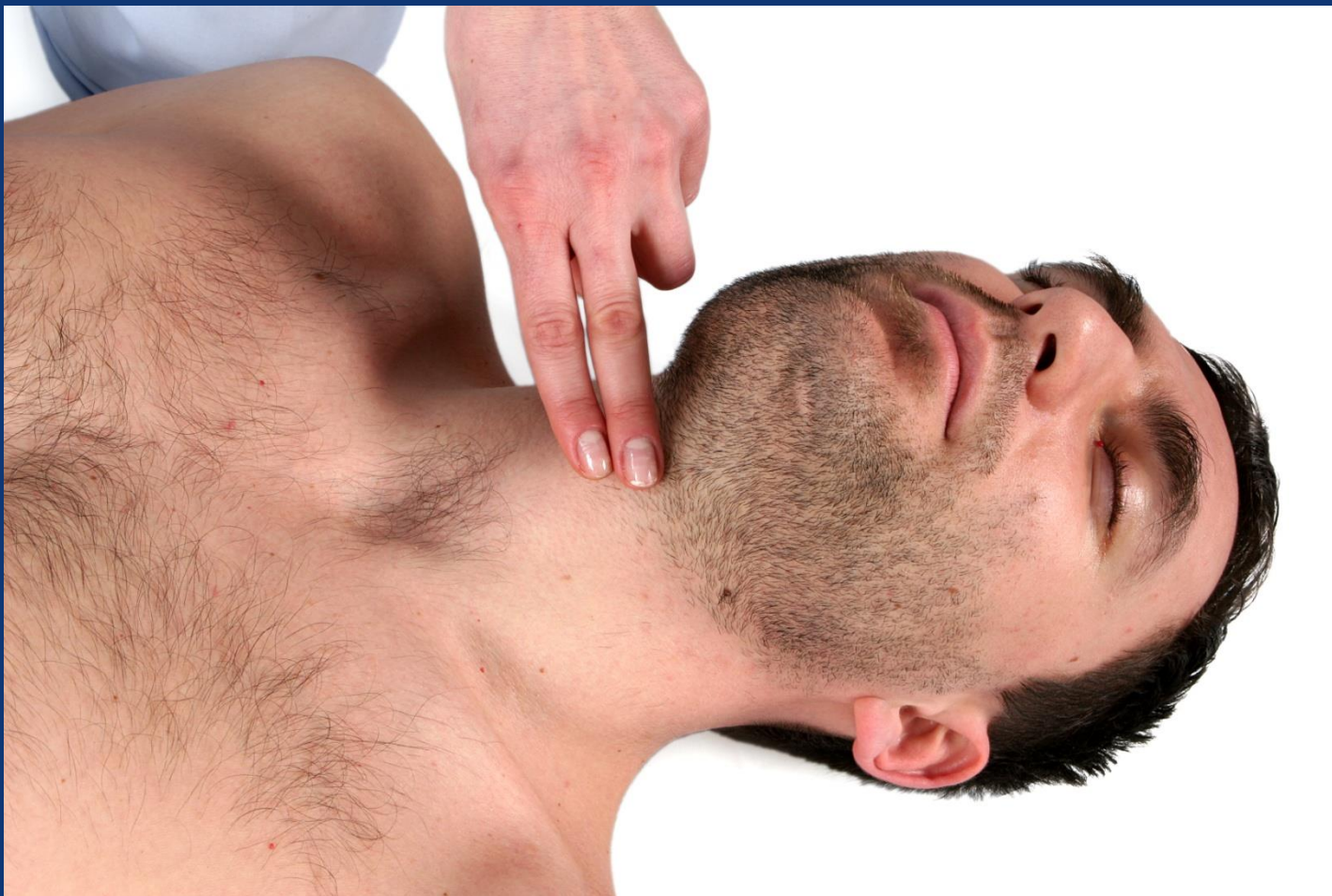
SUBLUXAȚIA MANDIBULEI



EVALUAREA VENTILAȚIEI



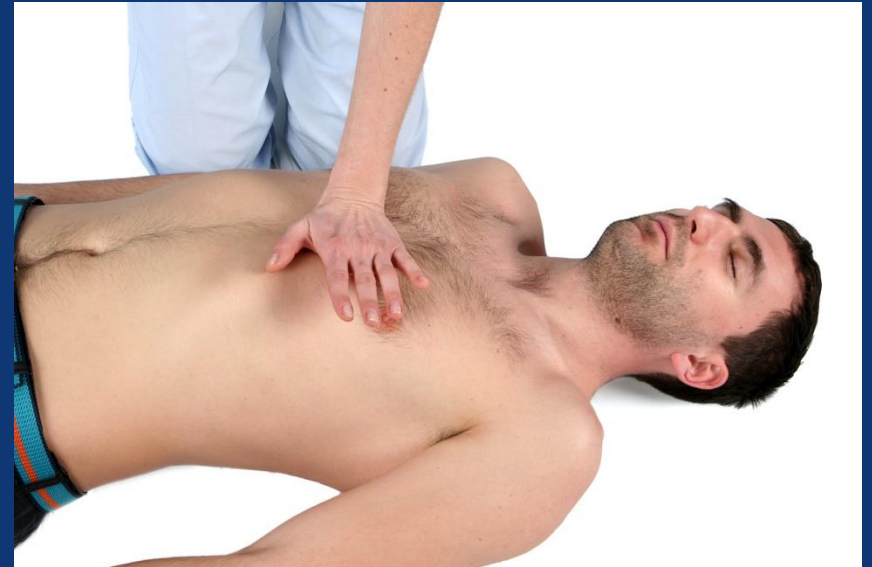
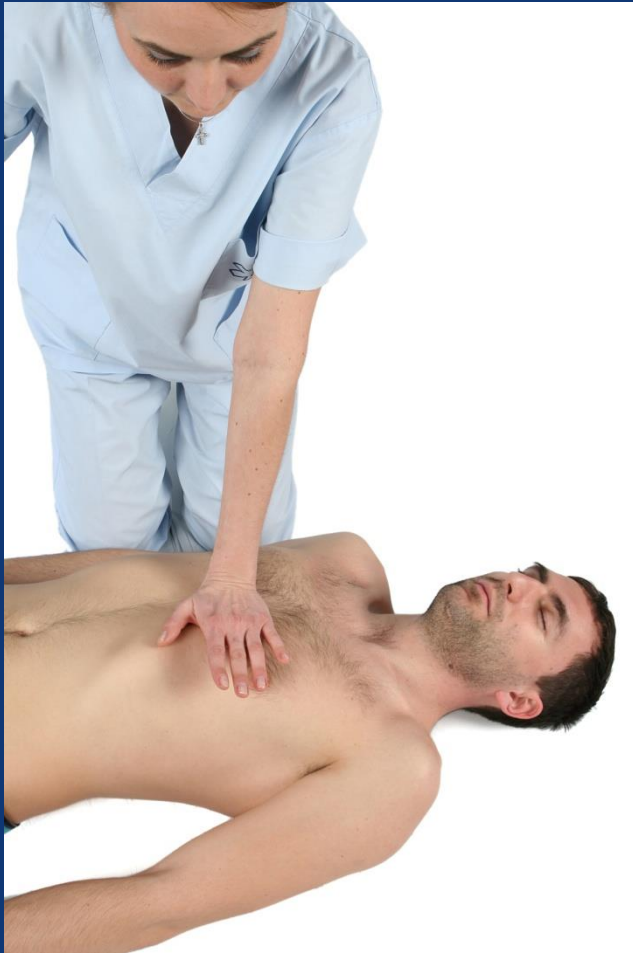
EVALUAREA CIRCULAȚIEI



EVALUAREA CIRCULAȚIEI



COMPRESIILE TORACICE



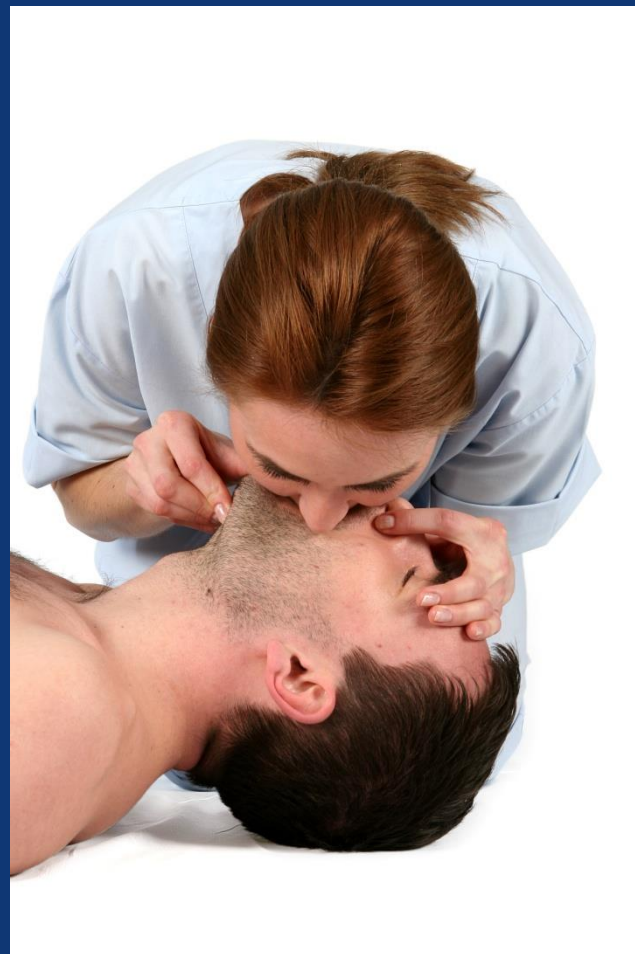
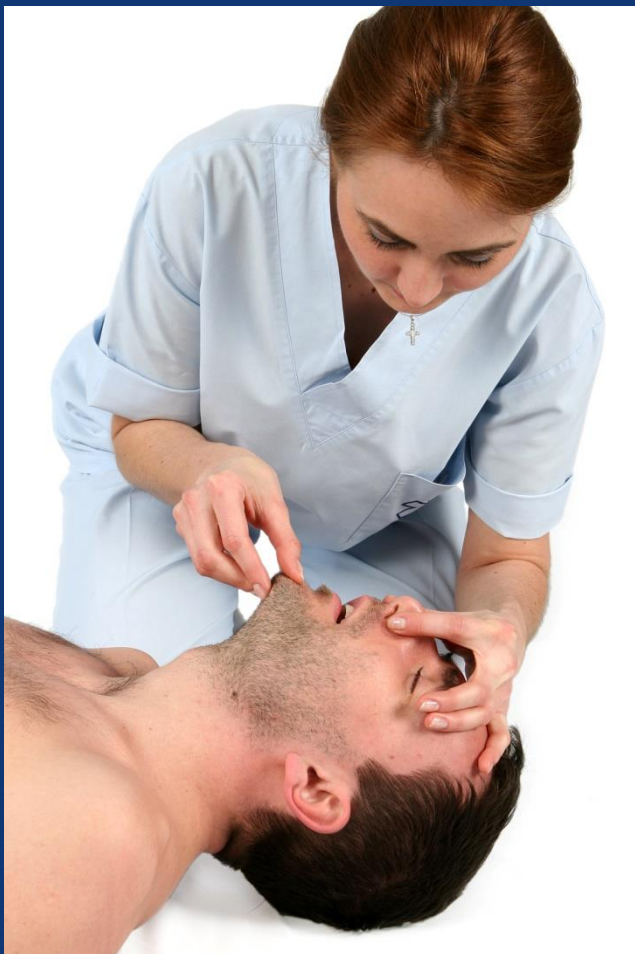
COMPRESIILE TORACICE



COMPRESIILE TORACICE



VENTILAȚIA GURA LA GURA



VENTILAȚIA GURA LA GURA



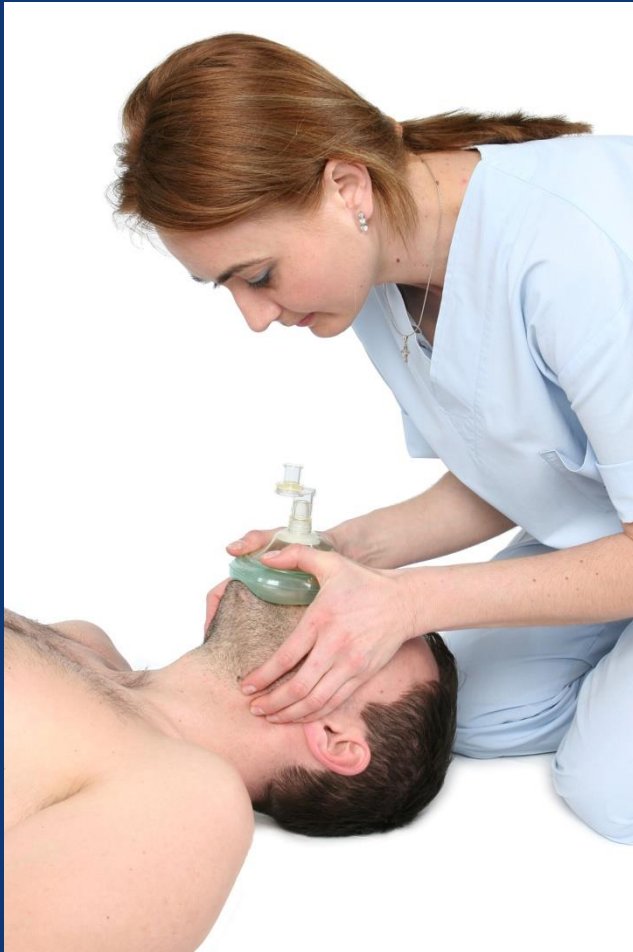
VENTILAȚIA GURA LA NAS



MASCA DE PROTECȚIE



POCKET - MASK





Suport Vital de Bază și Defibrilarea automată externă (AED)

Inconștient sau nu respiră normal



Anunțați serviciile de urgență



Efectuați 30 de compresii



Administrați 2 respirații



Continuați RCP 30:2



**De îndată ce aveți un AED,
porniți-l și urmați
instrucțiunile acestuia**

POZIȚIA DE SIGURANȚĂ

- Persoane inconștiente care respiră normal
- (leziune de coloană)
- 30 de minute

POZIȚIA DE SIGURANȚĂ



POZIȚIA DE SIGURANȚĂ



POZIȚIA DE SIGURANȚĂ



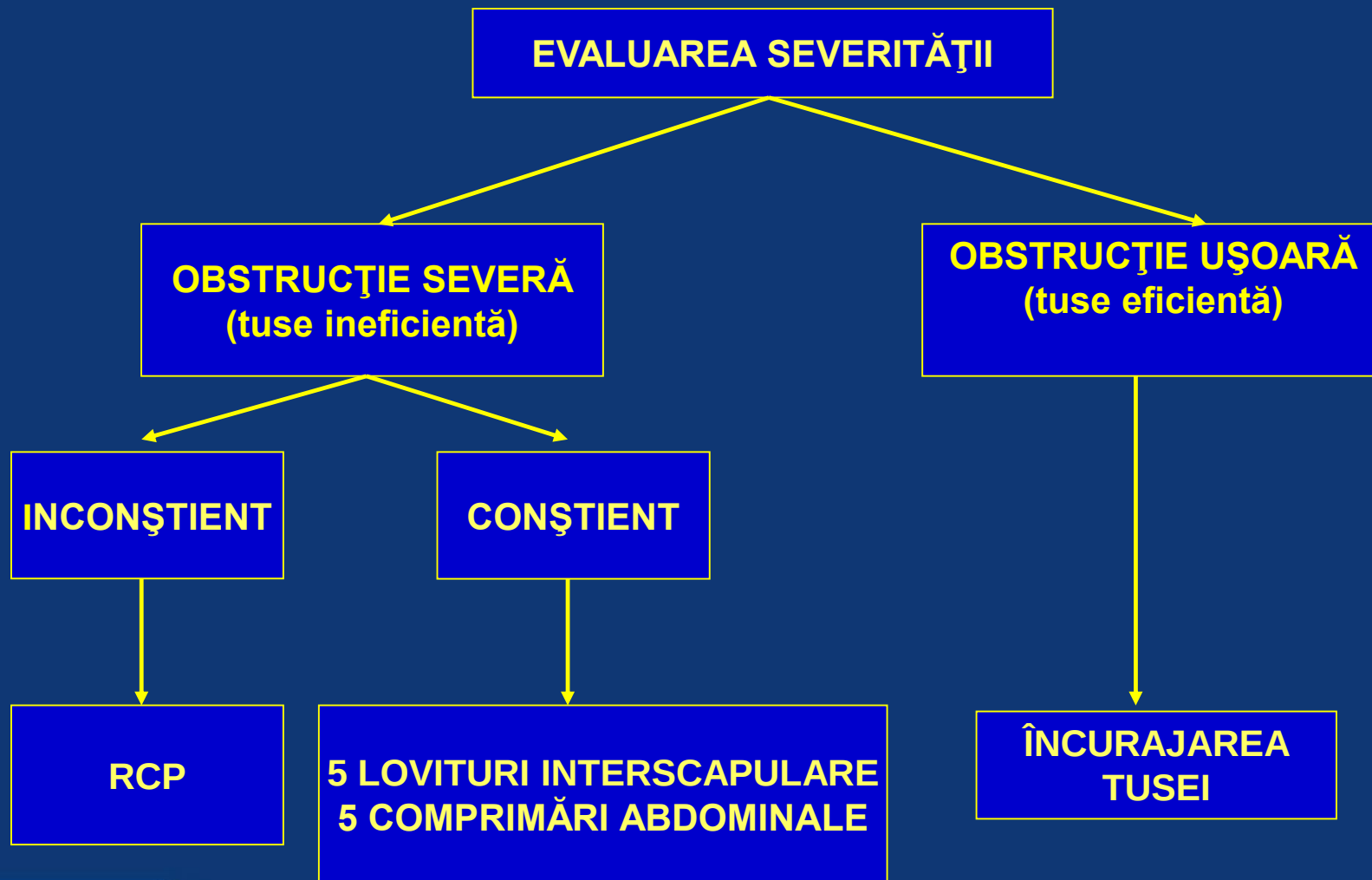
POZIȚIA DE SIGURANȚĂ



POZIȚIA DE SIGURANȚĂ



OBSTRUCȚIA CU CORP STRĂIN A CĂILOR AERIE



SEMNUL HEIMLICH



LOVITURI INTERSCAPULOVERTEBRALE



MANEVRA HEIMLICH



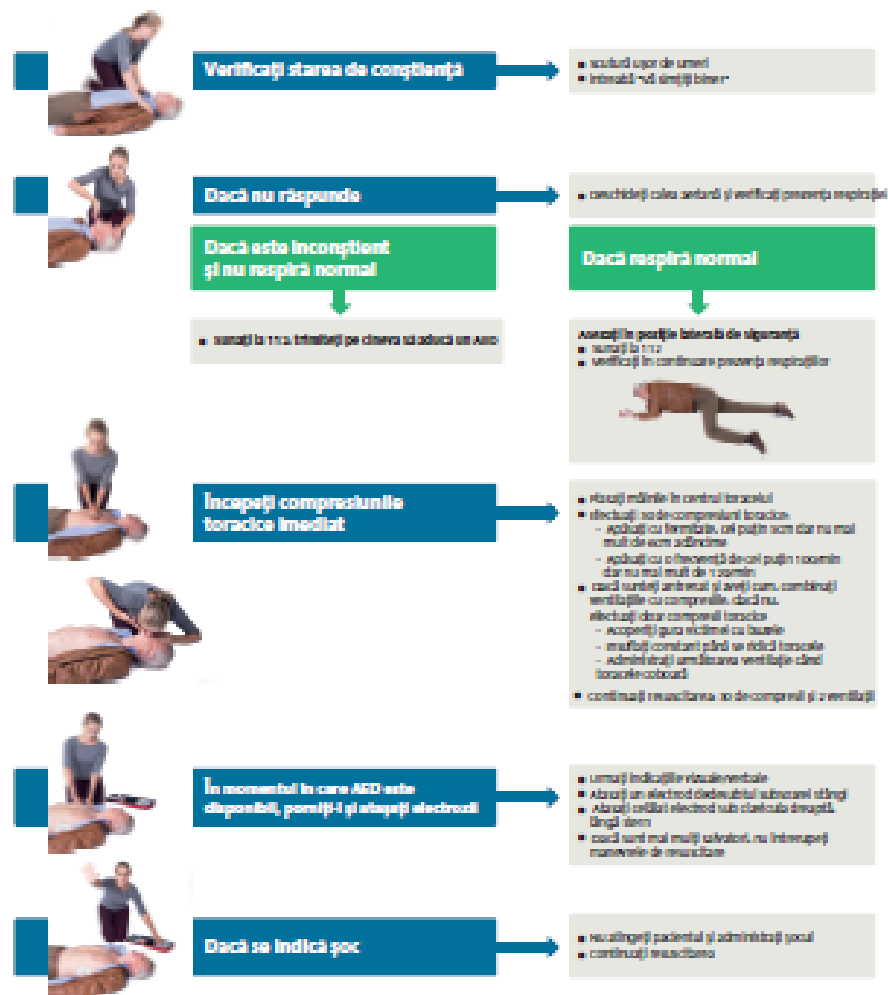
CONTROLUL CAVITĂȚII BUCALE





EUROPEAN
RESUSCITATION
COUNCIL

Suport Vital de Bază, cu utilizarea unui Defibrilator Automat Extern (AED)



Urmăriți instrucțiunile AED

Continuați manevrele de resuscitare până când victima își revine și începe să respire normal